What is claimed:

1. A diesel engine exhaust system comprising:

   a soot filter; and

   low temperature NO_2 trap material deposited on a carrier upstream and in train with the soot filter.

2. The exhaust system of claim 1, wherein the exhaust system further comprises a diesel oxidation catalyst upstream of the carrier with the deposited NO_2 trap material.

3. A diesel engine exhaust system comprising:

   a soot filter; and

   low temperature NO_2 trap material comprising zeolites selected from the group consisting of acidic zeolites and base metal-exchanged zeolites, and wherein the low temperature NO_2 trap material is deposited on a carrier upstream and in train with the soot filter.

4. The exhaust system of claim 3, wherein the zeolites are selected from the group consisting of ZSM-5, ETS-10, Y zeolite, Beta zeolite, ferrierite, mordenite, titanium silicates, and aluminum phosphates.

5. The exhaust system of claim 3, wherein the base metals are selected from the group consisting of Mn, Cu, Fe, Co, W, Re, Sn, Ag, Zn, Mg, Li, Na, K, Cs, Nd, Pr and combinations thereof.

6. The exhaust system of claim 3, wherein the zeolites comprise a trivalent metal which in combination with Si forms an oxidic skeleton.

7. The exhaust system of claim 6, wherein the trivalent metal comprises at least one metal selected from the group consisting of Al, B, Ga, In, Fe, Cr, V, As and Sb.

8. The exhaust system of claim 6, wherein the zeolites comprise three-dimensional alumina-silicate zeolites characterized by pore openings whose smallest cross-section

dimensions are at least 5 Angstroms and having a silicon to alumina ratio of at least 5.

9. The exhaust system of claim 6, wherein the zeolites comprise titanium silicates.

10. The exhaust system of claim 3, further comprising a diesel oxidation catalyst upstream of the soot filter.

11. The exhaust system of claim 10, wherein the NO_2 trap material is deposited on a carrier that is interposed and in train with the diesel oxidation catalyst and the soot filter.

12. The exhaust system of claim 11, further comprising a canister, wherein the canister houses both the low temperature NO_2 trap material and the soot filter.

13. The exhaust system of claim 3, wherein the soot filter comprises a ceramic monolithic structure having an upstream axial end and a downstream axial end, the structure having parallel flow channels with macroporous walls, wherein the channels having an opening at the upstream axial end are closed at the downstream axial end, and the channels having an opening at the downstream axial end are closed at the upstream axial end, thereby defining upstream and downstream sides of the channel walls.

14. The exhaust system of claim 13, wherein a catalyst composition is deposited on the downstream side of the channel walls of the soot filter.

15. The exhaust system of claim 14, wherein the catalyst composition, deposited on the downstream side of the channel walls of the soot filter, comprises a lean NOx catalyst composition.

16. The exhaust system of claim 14, wherein the catalyst composition, deposited on the downstream side of the channel walls of the soot filter, comprises a catalyst

composition effective for the combustion of unburned hydrocarbons and carbon monoxide.

17. A method of treating a diesel exhaust stream containing NO_2 and soot, comprising:
passing the exhaust stream through the exhaust system of claim 1;
adsorbing at least some of the NO_2 onto the low temperature NO_2 trap material and at least some of the soot onto the soot filter;
heating the low temperature NO_2 trap material to desorb at least some of the adsorbed NO_2 from the low temperature NO_2 trap material; and
oxidizing at least some of the adsorbed soot with the desorbed NO_2.

18. A method of treating a diesel exhaust stream containing NO_2 and unburned hydrocarbons, comprising:
passing the exhaust stream through a diesel engine exhaust system comprising a soot filter and low temperature NO_2 trap material deposited on a carrier upstream of the soot filter;
adsorbing at least some of the NO_2 onto the low temperature NO_2 trap material and at least some of the unburned hydrocarbons onto the low temperature NO_2 trap material;
heating the NO_2 trap material to desorb at least some of the adsorbed NO_2 and some of the unburned hydrocarbons from the low temperature NO_2 trap material; and
oxidizing at least some of the unburned hydrocarbons with the desorbed NO_2.

19. The method of claim 18, wherein the low temperature NO_2 trap material comprises zeolites selected from the group consisting of acidic zeolites and base-metal exchanged zeolites.

20. The method of claim 18, wherein the exhaust system further comprises a lean NOx catalyst deposited on the soot filter.

21. A method of removing NO_2 from an inlet gas stream, comprising contacting the inlet gas stream with low temperature NO_2 trap material to adsorb at least some of the NO_2 onto the trap material.

22. A composition, comprising: a zeolite exchanged with a base metal, wherein
the zeolite is selected from the group consisting of ZSM-5, ferrierite, titanium silicates, aluminum phosphates, gallosilicates and borosilicates; and
the base metal is selected from the group consisting of Mn, Cu, Fe, Co, W, Re, Sn, Ag, Zn, Mg, Li, Na, K, Cs, Nd and Pr.

23. The composition of claim 22, wherein the zeolite is a titanium silicate and the base metal is selected from the group consisting of Mn and Co.

24. The composition of claim 23, wherein the zeolite is ETS-10.